

CUCHUMATANEA
A NEW GENUS OF THE COMPOSITAE
(HELIANTHEAE)¹

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Cuchumatanea Seidenschnur & Beaman, gen. nov.

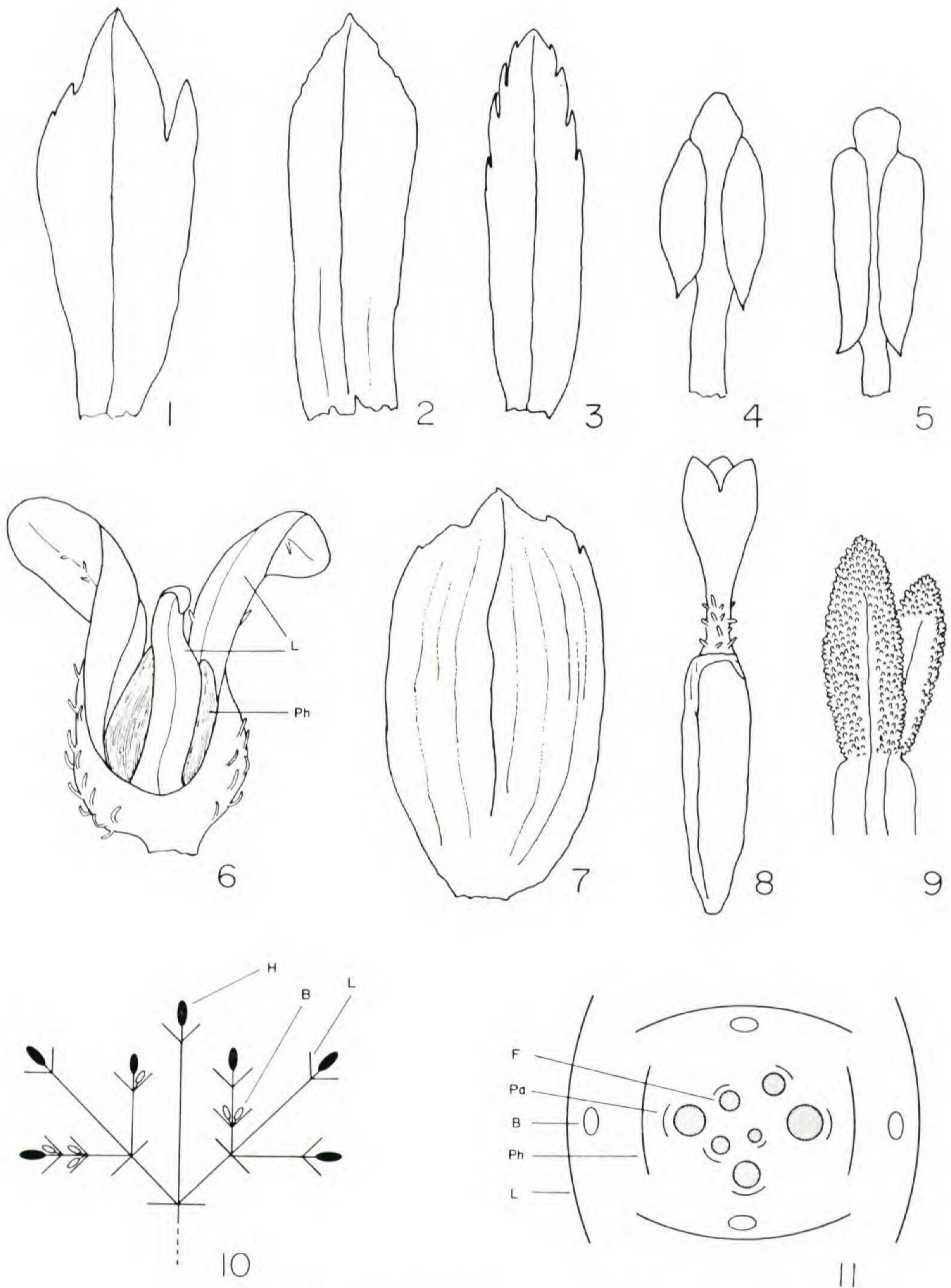
Herba annua, minuta, depressa. Folia opposita, spathulata, obscure trinervia, basi leviter connata. Rami oppositi ad nodos. Capitula homogama, sessilia vel subsessilia, terminalia, solitaria, cum pare foliorum clavato-spathulorum circumclusa. Phyllaria 2, late oblongo-ovata, basi subite attenuata, membranacea valde concava, laxe flosculos involventia. Receptaculum conicum, paleaceum, paleis membranaceis flosculos non amplectentibus, exterioribus oblongo-ovatis, interioribus gradatim angustioribus usque ad centrales lineares. Flosculi 5-10 in capitulo, hermaphroditi actinomorphi. Corolla anguste tubuloso-campanulata, 3-4 lobata, infra flava, sursum purpurea. Stamina 3-4, antheris connatis basi sagittatis, apice cum appendice late ovata vel suborbiculata ornata. Stylus infra ramos contractus, ramis oblongo-ellipticis, acutis, lato margine dorsoque dense papilloso. Achaenia ellipsoideo-oblonga deorsum paulo attenuata levissime compressa, striolata, brunneo-nigra. Pappus nullus.

Minute, depressed annual. Leaves opposite, spatulate, inconspicuously 3-veined, the bases slightly connate. Each node with two axillary branches. Heads homogamous, sessile or subsessile, solitary, terminal, surrounded by a pair of spatulate-clavate leaves. Phyllaries 2, broadly oblong-ovate, subpetiolate, membranaceous, strongly concave, loosely enclosing the florets, the outer oblong-ovate, the inner becoming progressively narrower, the innermost linear. Florets 5-10, hermaphroditic, actinomorphic. Corolla tubular, narrowly campanulate, 3-4 lobed, yellowish below, purplish above. Stamens 3-4, anthers connate, sagittate, with broadly ovate to suborbicular apical appendages. Style constricted just below the branches, the branches oblong-elliptical, acute, papillose to the base. Achenes ellipsoid-oblong, weakly compressed, brownish-black, striate. Pappus absent.

Cuchumatanea steyermarkii Seidenschnur & Beaman, sp. nov.

Herba annua, minuta, depressa usque ad 1 cm. alta, radice palari, saepe caespitosa. Caulis plus minusve sparse hirtellus vel glabratus,

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[Legend for figures 1-11]

Fig. 1-4, 6-11. *Cuchumatanea steyermarkii*, based on *Beaman 3962*.
 Fig. 5. *Jaegeria hirta*, based on *Beaman 4532*. Fig. 1-3. Pales ($\times 15$).
 Fig. 4-5. Stamens ($\times 40$). Fig. 6. Head and subtending leaves ($\times 7$,
 L, leaf; Ph, phyllary). Fig. 7. Phyllary ($\times 15$). Fig. 8. Floret with
 achene ($\times 20$). Fig. 9. Style branches ($\times 75$). Fig. 10. Diagram of
 a terminal portion of the branching system (B, bud; H, head; L, leaf).
 Fig. 11. Diagram of a head with subtending leaves (B, bud; F, floret;
 L, leaf; Pa, pale; Ph, phyllary).

viridis vel purpurascens composite dichasiale ramosus. Folia opposita decussata, basi paulo connata, saepe in pare inaequilonga, 3-7 mm longa 0.8-3 mm lata, spathulata, integra, margine parce revoluta sparse ciliata, 3-nervata sed nervis plerumque inconspicuis, supra glabra, subtus praecipue in nervo medio sparse pubescens. Capitula homogama, sessilia vel subsessilia, terminalia, solitaria, campanulata, circa 2 mm alta 1 mm lata, cum duobus foliis brevibus clavato-spathulatis amplexantibus, 2-3 mm longis 1.2 mm latis, adpresse subtendentia partimque tecta. Phyllaria 2 circa 2.5 mm longa 1.5 mm lata plerumque inaequilonga, oblongo-ovata basim angustata, membranacea sed apice recurva herbacea leviter lacerata, 3-venulosa, dorso ad venulam mediam parvis pilis, valde concava, laxe flosculos involventia. Receptaculum 0.2-0.5 mm altum, conicum, paleaceum. Paleae membranaceae persistentes flosculos non involventes, 1.5-2 mm longae, venula media conspicua aliquando 2-3 venulis lateralibus fere inconspicuis, glabrae, sursum margine minute laceratae deorsum integrae, exteriores oblongo-ovatae, ceterae gradatim angustiores usque ad centrum lineares. Flores omnes hermaphroditi, 5-10, plerumque 7 in capitulo. Corolla tubulosa 1 mm longa, limbo subcampanulato, 3-4 lobato, lobis ovatis acutis purpureis glabrisque, tubulo 0.5 mm longo flavo, sparse pilosulo. Stamina 3-4 non semper pari quam corollae lobi, antheris basi sagittatis, apice appendice ovata vel suborbiculata, thecis 0.4 mm longis parietibus crassis. Stylus infra lobos constrictus, ramis oblongo-ellipticis, acutis, marginibus dorsoque papilloso, uno saepe quam altero longiore. Achaenia 1.1 mm longa, ellipsoideo-oblonga, basim versus attenuata, levissime compressa, basi obtusa, brunneo-nigra, striata, glabra. Pappus nullus. Chromosoma $n = 8$.

Minute, depressed, taprooted annual herb, 1 cm or less high, occurring in patches and tending to form open mats. Stems glabrate to sparsely hirtellous, greenish or purplish, with two axillary branches at each node, one branch system arising from each leaf axil. Leaves opposite, decussate, 3-7 mm long, 0.8-3 mm wide, one member of each pair usually larger than the other, spatulate, entire, the bases slightly connate, margins sparsely ciliate, somewhat revolute, with 3 inconspicuous veins, glabrous adaxially, sparsely pubescent mostly on the midvein below. Heads homogamous, sessile or subsessile, solitary, terminal, campanulate, ca. 2 mm high and 1 mm wide, closely subtended and partly covered by a pair of small spatulate-clavate leaves 2-3 mm long and 1.2 mm wide. Phyllaries 2, ca. 2.5 mm long, 1.5 mm wide, one usually larger than the other, oblong-obovate, narrowing basally, mostly membranaceous but with herbaceous reflexed tip, lacerate near the apex, 3-veined, with a few hairs abaxially on the median vein, strongly concave, loosely enclosing the florets. Receptacle 0.2-0.5 mm high, conical, paleaceous. Pales membranaceous, not surrounding the florets, 1.5-2 mm long, 1-veined, sometimes 2-3 incon-

spicuous lateral veins present, glabrous, minutely lacerate above, entire below, the outer oblong-ovate, the inner becoming progressively narrower, linear at the center of the head, persistent. Ray florets absent. Disk florets 5-10, commonly 7, hermaphroditic. Corollas tubular, narrowly campanulate, ca. 1 mm long, with 3-4 ovate acute lobes, tube 0.5 mm long, yellow, sparsely pilose, limb and lobes purplish, glabrous. Stamens 3-4, usually of the same number as the corolla lobes, anthers connate, sagittate, with broadly ovate to suborbicular apical appendages, thecae 0.4 mm long, with thick walls. Style constricted just below the branches, style branches oblong-elliptical, acute, papillose to the base, one branch often longer than the other. Achenes 1.1 mm long, ellipsoid-oblong, weakly compressed, with an obtuse base, brownish-black, striate, glabrous. Pappus absent. Chromosome number $n = 8$, based on *Beaman 3962*. Fig. 1-11.

GUATEMALA. HUEHUETENANGO: Sierra de los Cuchumatanes, ca. 3 kms south of road between Llano de San Miguel and Todos Santos, from a point 2.5 miles west of Llano de San Miguel, near the highest point in the Cuchumatanes, collected from about the 3,680 to 3,740 meter level, in open *Pinus rudis* forest, occurring in patches in black soil near limestone outcrops, frequent in a local area, 2 August 1960, *J. H. Beaman 3962* (MSC 171943, holotype; F, GH, K, TEX, UC, US isotypes); vicinity of Chémal, summit of Sierra de los Cuchumatanes, 3,700-3,750 m, *Steyermark 50260* (F).

The existence of this remarkable tiny plant was first pointed out by Dr. Julian A. Steyermark to Beaman in connection with the planning of a collecting expedition to Guatemala in 1959. Dr. Steyermark found it on August 8, 1942, in the vicinity of Chémal, Sierra de los Cuchumatanes, Department of Huehuetenango, Guatemala. In his field book he noted that it was annual, with the corolla yellow, the leaves green and shining, fleshy, fairly membranaceous, growing in bunches and patches. His collection was subsequently examined by Dr. S. F. Blake who suggested to Steyermark that it probably represented a new genus near *Jaegeria* or *Schkuhria*. Blake pencilled on the sheet: "Jaegeria? Material too scanty & depauperate." In early August, 1959, and late July, 1960, Beaman made unsuccessful searches for the species in the vicinity of Chémal. But on August 2, 1960, it was discovered a few kilometers southwest of Chémal in one of the highest and most remote regions of the Cuchumatanes. In publishing the species it is a pleasure to associate the name of Dr. Steyermark with

that of the Sierra de los Cuchumatanes. He has been the leading contributor to the understanding of the exceptionally diverse and unusual flora of this mountain range.

Cuchumatanea steyermarkii is an extremely reduced species, especially characterized by reduction of the plant body and of the florets. There is also slight asymmetry of the pairs of axillary branches, leaf and phyllary pairs, and style branches, with one member of each pair generally somewhat smaller than the other. In spite of reduction in size, however, the species has retained a complex branching system (see fig. 10). Two branches generally arise from each of the 3-4 nodes (except the first which is often unbranched). Additional axillary branches or buds are also present at the nodes of the primary branches. A solitary head terminates each branch.

The heads are enclosed and somewhat concealed by subtending pairs of leaves. The two phyllaries follow the decussate pattern of the leaves (see fig. 6 and 11) and resemble immature leaves. In immature heads the subtending leaves are differentiated from the phyllaries mainly by the ciliate margins of the former and by their position. The two phyllaries partially surround the head and each subtends a pale and a marginal floret which is more advanced in development than other florets of the head.

The number of corolla lobes varies from 3 to 4, which is also true for the stamens. While the number of corolla lobes and stamens is often the same, there are sometimes florets with 4-lobed corollas and 3 stamens. Florets with 3-lobed corollas and 4 stamens have not been found. In one floret with two normal stamens a third stamen was found with the filament of twice the normal width and two fused anthers. Such a condition may support the contention that the 3- and 4-merous florets are the result of a reduction process which is still in progress.

Our findings confirm Blake's suggestion that the genus is related to *Jaegeria*. Among species of this genus it appears to be closest to *J. hirta* (Lag.) Less. The habit of *Cuchumatanea* is very similar to that of a collection of *J.*

Table 1. Comparison of *Cuchumatanea* with related genera.

	<i>Cuchumatanea</i> (<i>C. steyermarkii</i> , Beaman 3962)	<i>Jaegeria</i> (<i>J. hirta</i> , Beaman 4532)	<i>Siegesbeckia</i> (<i>S. repens</i> , Beaman 3699)	<i>Selloa</i> (<i>S. plantaginea</i> , Beaman 4240)
Heads	Discoid	Radiate	Radiate	Radiate
Phyllaries	2	5	5 outer and 2 series of inner	Very broad, imbricated in about 4 series
Pales	Not keeled	Keeled	Not keeled	Not keeled, narrowly linear
Number of disk florets	5-10	5-9	Ca. 40	Ca. 85
Number of disk corolla lobes	3-4	4-5	5	5
Style	Constricted below the branches	Not constricted	Not constricted	Not constricted
Style branches	Oblong-elliptical, acute, often unequal, papillose to the base	Lanceolate, acute, papillose to the base	Linear, acute, papillose to the base	Linear with triangular, tufted tips
Stamens	3-4, anthers sagittate, with broadly ovate to suborbicular appendages	5, anthers sagittate, with orbicular appendages	5, anthers slightly sagittate, green, with ovate appendages	5, anthers slightly sagittate, with broadly ovate appendages
Achenes	Brownish-black, striate, ellipsoid-oblong, glabrous	Brownish-black, striate, ellipsoid-oblong, glabrous	Brownish-black, striate, ellipsoid-oblong, glabrous	Brownish, striate, 5-angled, ellipsoid-oblong, glabrous
Pappus	Absent	Absent	Absent	3-5 deciduous awns

hirta (Beaman 4532) from La Cima, Federal District, Mexico. This specimen also has sagittate anthers with orbicular appendages which correspond closely to those of *Cuchumatanea*, although the latter has shorter thecae with thicker-walled cells along the margins. In another specimen of *J. hirta* (Bourgeau 1553 from the Valley of Cordoba, Mexico) the anthers seem to differ from those of *Cuchumatanea* mainly in not having thick-walled marginal cells. The genera are also similar in achenial structure, both having ellipsoid-oblong, slightly compressed, striate, glabrous achenes without pappus²

Although the features noted above indicate a close relationship of *Cuchumatanea* with *Jaegeria*, they differ by characters of a magnitude equal to those by which other Verbesinoid and Galinsoginoid Compositae are distinguished. The most important characters which separate the genera are as follows: (1) The heads of *Cuchumatanea* are discoid. Only *J. gracilis* Hook. f. from the Galapagos Islands is without ray florets (the type of *J. discoidea* Klatt, as noted by Robinson (1900), is radiate). (2) *Cuchumatanea* has only two phyllaries which do not surround the marginal florets but partially enclose the head. *Jaegeria* has 5 or more phyllaries each of which encloses an ovary or achene of a ray floret with slightly overlapping marginal membranes. (3) The tubular corollas of *Cuchumatanea* have 3-4 lobes rather than 5 as in *Jaegeria*, and the number of stamens in the former is also reduced. (4) The pales are unkeeled in *Cuchumatanea* and keeled in *Jaegeria*. (5) The chromosome number in *Cuchumatanea* is $n = 8$, while counts reported for four species of *Jaegeria* have all been on the base of $x = 9$ (Turner et al., 1962; Beaman and Turner, 1962; Turner

²After submitting the manuscript for publication we sent a copy of it and some of the material of *Cuchumatanea* to Dr. A. M. Torres who is currently monographing the genus *Jaegeria*. He notes that the specimen of *Jaegeria hirta* (Beaman 4532) which we have used for comparison is at the extreme end of variation (a reduced form) in this species and that more typical specimens appear less similar to *Cuchumatanea*. He considers *J. axillaris* Blake, known only from the type collection from Colombia, to be closer to *Cuchumatanea*.

and King, 1964). A further comparison of similarities and differences of *Cuchumatanea* and *Jaegeria*, in addition to the characters of two other related genera, is given in Table 1. We have not found any features to support Blake's tentative suggestion that *Cuchumatanea* might be related to *Schkuhria* (Helenieae).

Because of its alliance with *Jaegeria* and other genera placed by Hoffmann (1894) in the subtribe Verbesininae, we tentatively assign *Cuchumatanea* to this subtribe next to *Jaegeria*. A more satisfactory classification may ultimately bring certain genera of the Galinsoginae into closer association with this group of the Verbesininae.

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